Fact Sheet

TESTING BUILDING AIR EXCHANGE RATES

PROBLEM

Do buildings have too much air leakage? Are buildings receiving adequate ventilation? Radon, formaldehyde, carbon dioxide, and many other contaminant sources affect indoor air quality.

SOLUTION

Air exchange testing using a tracer gas can (1) determine air leakage rates when ventilation systems are closed or off, (2) determine ventilation rates when those systems are on or open. Tracer gases are non-toxic and readily detectable in minute quantities when released in a building to determine the rate at which they dilute. One then can equate the dilution rate with the air exchange rate due to air leakage or to ventilation.

RESULTS

Three techniques are available for buildings that may be characterized as a single zone. The less effectively that one may treat the building as a single zone, the more complex the tracer gas technique required. CRREL has performed tracer gas measurements at Fort Drum, New York, and at Forts Richardson and Wainwright in Alaska. One critical measurement showed that some hospital operating rooms were receiving only nine air changes per hour instead of the required 15.

STATE OF ART

CRREL was instrumental in the successful revision of ASTM E 741 for measuring air changes in buildings, using a tracer gas.

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